

## CLAIMS

5        1. A current mode pipelined analogue-to-digital converter (ADC) comprising a plurality of serially connected conversion stages ( $S_i$ ) wherein at least one conversion stage comprises, a stage input for receiving a current ( $r_{i-1}$ ) for conversion, a sample-and-hold (S/H) circuit (120, 130, 135) coupled to sample the current at the stage input during a first time period and to hold the  
10 sampled current during a second time period, the S/H circuit having first and second outputs (132, 131), the first output (132) delivering a mirror of the sampled current during the first time period and a mirror of the held current during the second time period and the second output (131) delivering the held current directly during the second time period, a current comparator means (140) having an input coupled to the first output of the S/H circuit for comparing a current at said input with one or more reference currents, a digital output coupled to an output of the current comparator means for producing a digital signal ( $D$ ) representing the digital conversion performed by the stage, a digital-to-analogue converter (DAC) (150) having an input coupled to the output of the  
15 current comparator means, and a summing means (160) having a first input coupled to an output of the DAC, a second input coupled to the second output of the S/H circuit, and an output for delivering a residual current ( $r_i$ ) during the second time period.

25        2. An ADC as claimed in claim 1, wherein the S/H circuit comprises a plurality of first outputs (132, 232) each delivering a mirror of the sampled current during the first time period and a mirror of the held current during the second time period, and further comprising a plurality of current comparator means (140, "140) each having an input coupled to a respective one of the first outputs of the S/H circuit for comparing a current at said input with one or more respective reference currents, and wherein the digital output is coupled to an output of each of the current comparator means for producing a digital signal  
30

( $D_p$ ,  $D_q$ ) representing the digital conversion performed by the stage, and wherein the DAC has a plurality of inputs each of said inputs respectively coupled to the output of a respective one of the current comparator means.

5        3. An ADC as claimed in claim 1 or 2, wherein the operations during the first and second time periods are interchanged for adjacent conversion stages.

10      4. An ADC as claimed in claim 3, comprising two or more pluralities of serially interconnected conversion stages ( $S'_i$ ,  $S''_i$ ) operating in parallel wherein the operations during the first and second time periods are multiplexed for corresponding parallel conversion stages.

15      5. An ADC as claimed in claim 1, 2, 3 or 4, wherein the current comparator means (140) comprises a non-regenerative circuit (140').

6. An ADC as claimed in claim 1 2, 3, or 4, wherein the current comparator (140) means comprises a regenerative circuit (141).

20      7. An electronic device comprising a current mode pipelined analogue-to-digital converter as claimed in any one of claims 1-6.

8. An electronic device as claimed in claim 7, wherein the electronic device is a wireless receiver or transceiver.